

CAPP Hydraulic Fracturing Operating Practice: FRACTURING FLUID ADDITIVE RISK ASSESSMENT AND MANAGEMENT

OVERVIEW

To support CAPP's Guiding Principles for Hydraulic Fracturing, seven Operating Practices have been developed in collaboration with CAPP member companies. These Operating Practices strengthen industry's commitment to continuous performance improvement in shale gas, tight gas and tight oil development.

The Fracturing Fluid Additive Risk Assessment and Management Operating Practice supports the Guiding Principles: **“We will support the development of fracturing fluid additives with the least environmental risks”**; and **“We will continue to advance, collaborate on and communicate technologies and best practices that reduce the potential environmental risks of hydraulic fracturing.”**

WHAT DOES THIS PRACTICE MEAN?

CAPP and its member companies are committed to reducing the environmental risks associated with the additives in fracturing fluids. Hydraulic fracturing fluids are primarily comprised of water, sand and a very small amount of chemical additives. This practice outlines the requirements for companies to better identify and manage the potential health and environmental risks associated with these additives; where possible, fracturing fluids with lower risk profiles can be selected.

Market demand for responsible fracturing fluids leads to the development of new, more environmentally sound products. These advances in technology help drive industry's environmental performance improvement. Collaboration is the key to the progression, development and implementation of new technologies that will reduce our industry's effect on the environment.

HOW WILL THIS WORK?

Under this Operating Practice, companies will assess the potential risks of fracturing fluid additives and create risk management plans to effectively manage the additives. This practice includes:

- Identifying chemical ingredients and characteristics of each additive.
- Assessing potential health and environmental risks of each additive.
- Defining operational procedures and controls for the identified risks.
- Incorporating risk management plans for each well fractured.

TECHNICAL DESCRIPTION

The purpose of this practice is to describe minimum requirements for the risk-based assessment and management of fracturing fluid additives used in the development of shale gas, tight gas and tight oil resources.

The objective of this practice is to enable and demonstrate conformance with the following CAPP Guiding Principles for Hydraulic Fracturing:

We will support the development of fracturing fluid additives with the least environmental risks.

We will continue to advance, collaborate on and communicate technologies and best practices that reduce the potential environmental risks of hydraulic fracturing.

BACKGROUND

Hydraulic fracturing is a controlled operation that pumps a fluid and a propping agent through the wellbore to the target geological formation at high pressure in multiple intervals or stages, in order to create fractures in the formation and facilitate production of hydrocarbons. Hydraulic fracturing is a safe and proven way to develop natural gas and oil; it has been used throughout the oil and gas industry for about 60 years.

Fracturing fluids are designed to ensure effective fracturing of the target shale gas, tight gas or tight oil reservoir and recovery of fracturing fluids. The process breaks up the target formation to create pathways that allow the gas to flow from the very low permeability reservoir toward the wellbore.

Fracturing fluids are comprised primarily of water and sand. For each stage of the fracturing process, water, propping agent and a very small amount of additives is injected into the wellbore within the hydrocarbon-bearing rock. Additives are used to improve the process. The make-up of fracturing fluid varies from one geological basin or formation to another and the difference between the formulations can be as small as a change in concentration of one specific compound. The number of chemical additives used in a typical fracture treatment also varies, depending on the conditions of the well being fractured. Each component serves a specific, engineered purpose.

SCOPE

This practice applies to CAPP member companies engaged in the development of shale gas, tight gas or tight oil resources through the application of hydraulic fracturing processes in Canada. While use of this practice is voluntary (subject to applicable laws and regulations), CAPP strongly encourages its use by member companies.

The practice is to be utilized to support the effective management of fracturing fluid additives during fracturing program design.

Operational Requirements

CAPP member companies meet or exceed the following requirements when using hydraulic fracturing additives:

- The chemical ingredients and the information regarding the chemical characteristics of each additive used, or proposed to be used, in hydraulic fracturing operations will be identified using the information provided by suppliers to the operating company, as required by regulation through the provision of Material Safety Data Sheets (MSDS).
- The potential health and environmental risks of each of the additives will be assessed by the operating company or suitably qualified third party selected by the operating company.
- Operational procedures and controls specific to the selected additive(s) will be determined to manage the potential health and environmental risks identified by the risk assessment, as appropriate.
- Written risk management plans will be incorporated into the well-specific hydraulic fracturing program.
- Execution of the risk management program and actual additives used will be confirmed prior to program initiation and at program completion.



Performance Measures

Conformance with this practice will be confirmed by demonstrating that:

- Procedures are in place to identify and assess the chemical characteristics of fracturing fluid additives.
- Procedures are in place to ensure that identified risk mitigation plans are developed and executed for each well fractured.

Reporting Expectations

Companies are expected to make their process for developing well-specific risk management plans for fracturing fluid additives publicly available.



DEFINITIONS

Additive: Any substance or combination of substances comprised of chemical ingredients found in a hydraulic fracturing fluid, including a propping agent, which is added to a base fluid in the context of a hydraulic fracturing treatment. Each additive performs a certain function and is selected depending on the properties required.

Base fluid: The base fluid type, such as water or nitrogen foam, used in a particular hydraulic fracturing treatment. Water includes fresh water, brackish or saline water, recycled water or produced water.

Fracturing fluid: The fluid used to perform a particular hydraulic fracturing treatment and includes the applicable base fluid and all additives.

Chemical Abstracts Service (CAS): The chemical registry that is the authoritative collection of disclosed chemical substance information.

Chemical Abstracts Service registry number (CAS number): The unique identification number assigned by the Chemical Abstracts Service to a chemical constituent.

Chemical ingredient: A discrete chemical constituent with its own specific name or identity, such as a CAS number, that is contained in an additive.

Material Safety Data Sheet (MSDS): A document, as required by the Controlled Products Regulations under the federal Hazardous Products Act, that contains information on the potential hazards (health, fire, reactivity and environmental) of an additive and its components.

Propping agent (Proppant): Typically non-compressible material, most commonly sand, added to the fracturing fluid and pumped into the open fractures to prop them open once the fracturing pressures are removed.

Shale gas, tight gas and tight oil: For the purposes of this practice, shale gas, tight gas and tight oil refers to unconventional resources from low permeability reservoirs being developed using horizontal wells with multi-stage hydraulic fracturing.

Supplier: A person, including an operator but excluding a service company, who sells or provides an additive directly to an operator for use in hydraulic fracturing treatments.